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Changing Times at Cuban Universities: Looking into the Transition towards a Social, Entrepreneurial and Innovative Organization

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Abstract: Since the 1990s, the socialist higher education system has faced several reforms oriented to satisfy social, economic, and technological demands. However, little is known about the transformation process of the socialist university system over the past two decades. This study provides a better understanding of the entrepreneurial and innovative transition of universities located in socialist economies. By adopting mixed theoretical approaches, we proposed a conceptual model to understand the social, the innovative, and the entrepreneurial transformation of socialist universities. We revised and tested this model in the context of Cuban universities by implementing a prospective case study approach. Our findings show insights about the transition towards a business model innovation within Cuban universities. The determinants have been state regulations, the closing of the complete cycle from teaching to the commercialization of results, and the creation of hybrid structures to manage knowledge. Consequently, the university is facing managerial challenges related to its ability to explore and exploit its activities to generate social, innovative and economic outcomes. Our results provide practical implications for the university managers and actors involved in the transformation process of Cuban universities.

Keywords: higher education system; social entrepreneurship; entrepreneurial universities; business model innovation; innovation ecosystem; socialist economies; Cuba

1. Introduction

During the last two decades, diverse university models have emerged into the new social and economic landscape [1,2]. Extant literature has provided insights about the entrepreneurial and innovative transformation pathways of universities [3–7]. Concretely, the transformation pathways have been associated with internal conditions like university governance/leadership, financial autonomy through diversified sources of funding [3], the organizational culture [4], and the university's resources and capabilities [6,7], as well as external conditions such as the influence of public policies on the configuration of the transit in a country [5] and the stakeholders' influence [6,7]. This accumulation of knowledge about innovative and entrepreneurial universities has legitimized the social, economic, and technological contributions in economies in places such as Australia, Europe, North America, and

the United Kingdom [6–10]. However, the experience of entrepreneurial and innovative universities from developed economies is not necessarily applicable in the case of universities located in socialist or emerging economies [11]. By contrasting with developed economies, Cuba has particularities based on the construction and sustainability of socialism. The premise is the centralized allocation of resources and vertical orientation in the design of public policies. Although the socialism premise is maintained, its current open strategy demands new institutional conditions to transiting into new ownership forms, as well as the configuration of the pillars of an innovative entrepreneurship ecosystem (i.e., banking reforms, the Science/Technology regulatory frameworks, and the entrepreneurial mindset). At the university level, entrepreneurship is not allowed. It explains the misunderstanding of entrepreneurship in the academic context, as well as the inexistence of actions to foster graduate and academic entrepreneurship.

A few studies have provided insights into the innovative and entrepreneurial role of universities located in socialist economies [10,12–15], as well as proposing frameworks to understand the link of the university into the national innovation system [16,17]. These studies provide insights about a third mission that is understood as the extension of social university functions and the knowledge transfer to society. Moreover, anecdotal evidence has evidenced some insights into new business models, as well as some insights on the involvement of the productive sectors' competitiveness and social wellbeing [18]. However, little is known about how we may conceptually understand the social, entrepreneurial, and innovative transformation process of universities in socialist economies. Concretely, how have universities located in socialist economies have been transforming themselves into social, innovative, and entrepreneurial organizations? How have university managers transitioned into innovative business models? How have universities located in socialist economies been impacting on the regional innovation system? How effective have the pro-market state regulations been?

Inspired by the research opportunities, this paper provides a better understanding of the entrepreneurial and innovative transition of universities located in socialist economies. By adopting the theoretical bases of entrepreneurial universities [4,6], social entrepreneurship [19], and business model innovation literature [20,21], we propose a conceptual model to analyze the transition of socialist universities into a social, innovative, and entrepreneurial organization. By using the retrospective case study methodology [22,23], we explore the entrepreneurial and innovative identity of Cuban universities by its transition of traditional business models into new business model innovation. Our findings show insights about the multiple challenges, determinants and the transition of Cuban universities.

Our research setting is the Cuban university. According to the Cuban Constitution [24], the university has been a non-profit public organization with an economic dependency on public funding given their social goal: to provide free and high-quality education to Cubans. After the 1990s economic crisis, the Cuban State redefined the national policies and higher education legislation to reinforce the relationship between the university and the productive sector [25]. At this stage, technology and innovation were priorities for improving the socio-economic situation faced by the productive sector through enhancing its collaboration with universities. This action was oriented towards the generation of economic and social impacts via the university in pursuit of the country's growth [24]. Several incentives and intermediaries (i.e., the technology transfer offices) were implemented to enhance the generation, management, and commercialization of technology [18]. Afterwards, due to the need for updating the Cuban economic model in 2016, the Cuban State established new economic and social policies [25,26]. At the higher education level, Article 14 prioritized the link between organizations that developed productive activities and universities that guarantee their technological and innovative transformation [26] (p.8), and Article 22 prioritized the generation of qualified human capital accordingly to the needs of the new economic and social model [26] (p.10). Concretely, these articles guaranteed the proactive role of universities into the country's social, cultural, and economic development.

After this introduction, the paper is structured as follows. The second section analyzes the theoretical foundations linking entrepreneurial universities and business innovation models. The third

section describes the case study methodology adopted in this research. The fourth section presents the findings and discusses them considering previous studies. The paper concludes with the conclusions, implications, and research agenda.

2. Theoretical Foundations

2.1. Understanding the Entrepreneurial and Innovative Identity of Universities

Despite the lack of consensus, an entrepreneurial and innovative university is generally understood as a natural incubator that provides an adequate environment to support the entrepreneurial and innovative initiatives developed for the university community (i.e., students, academics, staff, alumni) [6–8,10]. The adequate environment has been configured by conditions that foster entrepreneurship and innovation [1]. Based on the accumulation of knowledge regarding this phenomenon, Table 1 summarizes the determinants, the inputs, and the outputs of universities with an entrepreneurial and innovative identity.

Table 1. Key elements behind the entrepreneurial and innovative identity of universities.
Source: Authors.

Key Element		Characteristics of Entrepreneurial and Innovative Universities
Determinants	External	Public budget restrictions Spin-off/start-up normative Knowledge transfer regulations Labor market conditions
	Internal	University has created an adequate entrepreneurship and innovation ecosystem A strong relationship with agents involved in the regional innovation and entrepreneurship ecosystems
Inputs	Resources	Incentives and reward systems Mentors supporting entrepreneurship and innovations Technology and innovation resources
	Capabilities	Leadership Positioning in the radar Networks and alliances
Outputs	Teaching	Job seekers and entrepreneurs
	Research	Publications
	Transference	Patents, licenses, spin-offs
Business model		Multiple income streams Exploration/exploitation of entrepreneurial and innovative opportunities

Regarding the external conditions, Guerrero et al. [2] evidenced the role of universities as a key participant and contributor within the regional innovation systems. In this vein, by adopting the endogenous growth theory, Guerrero, Cunningham and Urbano [8] proposed a conceptual framework to understand the economic contribution of universities in society. Concretely, the universities' core activities have been associated with the economic production function. Consequently, teaching has been linked to the human capital factor; research has been related to knowledge capital; and transference has been related to technological and entrepreneurial capital [10]. Therefore, university managers should adapt to the university role based on the stakeholders' requirements in terms of qualified human capital, knowledge, and new technological advances [27].

Regarding the internal conditions, Clark [4] proposed the internal pathways for the entrepreneurial and innovative transition of universities. However, many of these pathways have evidenced in universities located in the context of advanced economies such as North American Universities [3], European Universities [6,7,11,27], and Asian universities [28–30]. Therefore, these pathways do not necessarily apply in the context of emerging or socialist economies. The plausible explanation is the existence of institutional voids, as well as the specific realities and needs demanded by these economies [9,11]. For instance, one of the most relevant pathways has been the diversified sources of

funding motivated by the reduction of public resources [4]. Therefore, innovative and entrepreneurial universities should look for sustainable sources of funding [10]. In this vein, university managers should look for new alternatives to capture value from the university's resources and capabilities efficiently [31].

The main inputs and outputs of entrepreneurial and innovative universities are aligned to their core activities [6,8,10]. In this assumption, the entrepreneurial and innovative university should adapt its business model for responding to the new demands of the stakeholders and global context [21]. The main challenges are aligned with the organizational culture, the attitudes towards entrepreneurship and innovation, and the (in)formal relationships with stakeholders [2,28,32]. For instance, the transformation process has been motivated by the fostering of entrepreneurial initiatives through spin-offs/start-ups and technology-based ventures [10]; as well as innovative initiatives through the transference of knowledge or technologies to the productive sectors via licenses, patents, inventions, and intellectual property rights [1].

2.2. Understanding the Social, Entrepreneurial, and Innovative Identity of Universities

In socialist economies, the universities' missions are defined by the state demands and oriented towards achieving the demands of qualified human capital [15]. By adopting the social entrepreneurship approach, we assume that any organization enrolled within the socialist context is occupied with developing innovations to address complex societal, economic, or environmental challenges [33]. However, the universities' sustainability is conditioned by the "entrepreneurial" ability of these organizations to access or leverage means (financial, human, physical, and technological). Based on the accumulation of knowledge of this phenomenon, Table 2 shows the differences observed in the determinants, inputs, outputs, and business models with entrepreneurial and innovative universities described in the previous section.

Table 2. Key elements behind a social, entrepreneurial, and innovative identity of universities. Source: Authors.

Key Element		Universities within Socialist Economies	Differences between Entrepreneurial and Innovative Universities
Determinants	External	State regulations and demands Economic crises and social uncertainty	The misunderstanding of an entrepreneurial identity within a socialist society and disconnection with local agents
	Internal	Knowledge transfer infrastructures	The lack of favorable attitudes towards entrepreneurship and innovation given the misunderstanding of these terminologies
Inputs	Resources	Intellectual human capital but without motivation Technological resources	The lack of incentives towards entrepreneurship and innovation
	Capabilities	Specialized groups associated with the industry	The lack of entrepreneurial leadership that promotes these transformation process, as well as the disconnection with the productive sector
Outputs	Teaching	Job seekers	The lack of start-ups (graduate entrepreneurs)
	Research	Publications	
	Transference	Patents, licenses	Lack of spin-offs (academic entrepreneurs)
Business model		Dependency on state funds Delimited activities and resources	The sources of funding and the absence of innovative and entrepreneurial orientation

Regarding the determinants, the social identity of universities located in socialist economies is determined by the state. Therefore, the transformation towards an entrepreneurial and innovative organization should be determined by reforms in the higher education system and motivated by the socio-economic conditions [14]. Despite the state legitimization, the misunderstanding of what an entrepreneurial and innovative university means has represented the main obstacle for connecting universities with external agents [13]. In this vein, the social norms and culture condition the transformation of universities [9,11]. At the internal level, the existence of knowledge transfer infrastructures that support knowledge management is favorable to this transformation [2]. However, the lack of an entrepreneurial culture and favorable attitudes towards entrepreneurship represents another barrier in the transformation process [11]. It is explained by the lack of understanding of the university community about the meaning and significance of entrepreneurial initiatives [15].

Regarding the inputs and outcomes, the transformation process is also conditioned by the development or improvement of university capabilities [31]. The university leadership, staff, academics and faculty are the main actors in the implementation and the success of any university core activity. However, the socialist universities are characterized by a lack of incentives that foster the enrolment of the university community as well as a lack of leadership that promotes links with the productive sectors [15]. It implies an organizational culture characterized by focusing only on the achievement of the university's social purposes. Therefore, the university community should acquire skills and knowledge that are required to implement the business practices introduced in the new university's business models [34]. It will open a window towards understanding the creation of star-ups by graduate entrepreneurs or spin-offs by academic entrepreneurs [10]. The intervention of external agents should be an alternative for building a social, innovative, and entrepreneurial identity.

2.3. Understanding the Business Model Innovation of Socialist Universities

According to Zott and Amit [20] (p. 110), business model innovation is understood as the way in which an organization "does business" with its clients, partners and suppliers. In other words, it is a system of activities that are developed by the focal organization, and its partners carry out to meet the perceived technological needs in the market. In this vein, innovation business models refine the objectives, value propositions, and expected outcomes [35–37]. Consequently, the business model should be aligned to the organizational identity (i.e., social, entrepreneurial, and innovative).

At the university context, extant studies have evidenced that universities have applied business models such as a mechanism to position the contribution of their core activities into the regional competitiveness [38], to achieve sustainability [21,39], and create value according to the Oslo Manual [40]. Social entrepreneurship research has also evidenced the design of hybrid models based on the dual mission: social and entrepreneurial [19,36]. However, little is known about the configuration of university business model innovation in socialist economies that are characterized by a non-profit orientation.

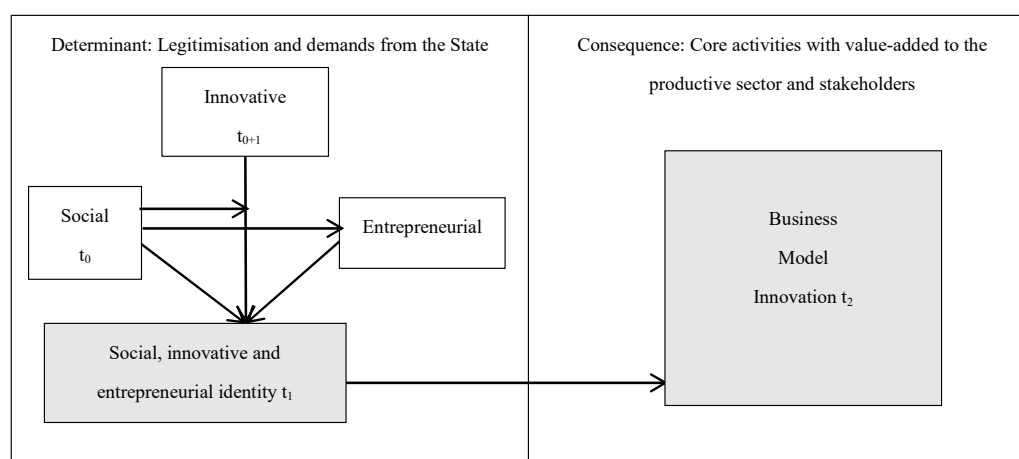
Table 3 shows the main details of the accumulation of knowledge of business models in the university context. The business model innovation design implies the precise definition of the organizational objectives considering the stakeholders' needs and aligns them to the organizational strategies [41]. Then, it will be necessary to define the resources and capabilities needed to achieve the expected results without forgetting the relationships with external agents enrolled in the innovation ecosystem [39,42–44]. All elements are critical for implementing mechanisms that ensure the adaptation to the uncertain external conditions [44–46].

Table 3. Business model innovation applied in the university context. Source: Authors.

Authors	Business Model Innovation	Adaptation at the University Level
Mets [41]	The business model for commercializing R&D in the triple helix context	The university contributes to the intellectual capital The university optimizes the commercialization of research and new income stream Entrepreneurship is a critical component of the third mission
Gaus and Raith [39]	Value creation and knowledge transfer model	Knowledge transfer and entrepreneurship as part of the third university mission Business model innovation delight the university governance
Miller et al. [20]	Business model innovation under the stakeholder perspective	The business model is a system of combined university core activities Objectives and relationships are aligned to the business model innovation and its evolution
Abdelkafi, Hilbig and Laudien [42]	Business models of entrepreneurial universities in the area of vocational education	Key decisions and choices should take university managers Business model patterns that can be applicable to extend traditional business models and embark on an evolutionary path to satisfy the necessity of independently generating funds.
Armstrong [43]	Business model implications for North American universities	The influence of environmental conditions (institutional effectiveness and stability) Business model innovation as a tool for understanding and adapting to the environmental challenges
Posselt, Abdelkafi, Fischer, et al. [44]	Business model innovation	The definition of value proposition, business creation, communication, technology transfer within the university context

2.4. Proposed Conceptual Model

By assuming that business model innovation should be aligned to the identity of the organization, Figure 1 shows the proposed conceptual model for understanding the transition of socialist universities into social, innovative, and entrepreneurial organizations. Determined and legitimized by the State's demands, the universities in socialist contexts should align their social identity (provide qualified education and generate knowledge) with the innovative identity (technology transfer activities) and the entrepreneurial identity (commercialization of knowledge, technologies and innovations). Given the unique characteristics of socialist economies, the assimilation of the entrepreneurial culture may require the involvement of intermediaries (technology transfer offices, incubators) to facilitate the sensitization process and technology management [10,11]. By assimilating the aligned identity, universities will be able to configure the business model innovation activities that add value to the stakeholders [21,44].

**Figure 1.** The proposed conceptual framework. Source: Authors.

3. Methodology

3.1. Retrospective Case Study Approach

Our research setting was at Cuban universities. By drawing on the nature of this research and previous university qualitative studies [7,11,16,17], this research was designed according to a

retrospective case study perspective of the transition of Cuban universities into a social, innovative, and entrepreneurial organization. Although qualitative studies have several criticisms regarding convenience or biased sampling, the retrospective case study approach allows understanding events, facts, and activities that had already occurred and their results were known [22]. The transformation process of the Cuban universities has taken at least over the last two decades. Therefore, we believe that this methodological approach is the most appropriate to test our proposed model (Figure 1).

3.2. Data Collection and Data Analysis

The data collection process adopted the triangulation approach suggested by Yin [23]. This approach consists of combining diverse sources of information to gather data about the studied phenomenon. The primary sources of information were twenty semi-structured interviews with university actors (academics, university managers), intermediaries (head of incubators, technology transfer offices, development agencies), and productive sector representatives (organizations developing technological projects in collaboration with the university). To ensure the representativeness participants, the main criterion of selection was their involvement in this transition process of Cuban universities during the last twenty years. Changes in Cuban universities are assumed to be based on government regulations and standards and are generally homogeneous.

Table 4 summarizes the interviewees' profile. University actors (UA) are six academics and five managers involved in the most representative universities with the recognition of excellence in Cuba. The universities are the Universidad de La Habana (the longest established and most internationally visible university—three hundred years old), the Universidad Central Martha Abreu de las Villas (the third university inaugurated in the country—sixty-eight years old), the Universidad de Oriente (the second-highest public institution in the country—seventy years old), and the Universidad de las Ciencias Informáticas (one of the consolidated technological universities—eighteen years old). The six academics have the highest categories established by the Cuban Higher Education System: the senior researcher category and the senior lecture category. They have been involved in the development of teaching and research activities. The five university managers have acquired a strong experience in the direction of teaching (vice-rectors and head of teaching departments) and science/technology (vice-rectors, head of R&D center) core activities during their involvement in different universities. The intermediaries (I) have a vast experience in the incubation of university projects and the technology transfer of academic/professional services to the productive sectors and society. Concretely, the participants are the heads of one incubator, three technology transfer offices, and two development agencies. The representatives of product sectors are linked to three priority sectors in Cuba: the Biotechnology Industry, the Software Industry and the Science, Technology and Environment Ministry. These organizations have collaborated with universities for developing technological initiatives.

Table 4. Interviewees' profile. Source: Authors.

Profile	Number of Participants	Years of Experience (Average)	Age (Average)
UA: University actors	Six academics	47 years	70 years
	Five university managers	25 years	54 years
	Head of incubators	27 years	43 years
I: Intermediaries	Heads of three technology transfer offices	30 years	53 years
	Head of two development agencies	33 years	60 years
P: Productive sector representatives	Three representatives of organizations developing technological projects in collaboration with the university	31 years	69 years

The fieldwork was developed for nine months (May 2019–February 2020). Each interview had a duration of 1 to 2 h, as well as with the possibility of re-contacting to clarify doubts or gaps. Concerning the data analysis, all interviews were recorded and transcribed. The transcriptions were complemented

using secondary data from official documents and annual reports. Afterwards, the data were coded and analyzed according to the patterns and concepts identified in our proposed model (see Appendix A).

4. Findings

4.1. The Transition into Business Model Innovation

The identity of Cuban universities has been identified through the evolution of its business model. Three decades ago, the business model of Cuban universities was defined by the academic, research and university extension activities (Table 5). According to the interviews, the State acted as the primary client and the sole funder in this traditional business model. The State maintained their investment during this period for ensuring the quality of the education [18]. Therefore, given the financial dependency, Cuban universities' value propositions were defined by the State demands: generate qualified human capital, cover the labor market needs, create cutting edge knowledge, and diversification of research fields, among others. In this vein, the most relevant clients were employers, enterprises, and research centers.

Since the 1990s, the Cuban university business model transitioned towards new sources of funding (revenue streams) by the introduction of activities related to the commercialization of innovation and technology transfer (new added value) via intermediary structures (channels). According to university actors, "as the funding amount destined to the university decreased, universities were oriented to identify potential services to commercialize, as well as to evaluate a new type of relationships with the productive sector" (Interview UA11). However, these new activities were not conceptually understood as the so-called third mission of American and European universities. According to the interviews, the transition of universities was based on trial and error with the involvement of intermediaries for knowledge innovation management. The State increased its investment in higher education and infrastructures but without clear evidence about the return of this investment [18].

Table 5. The traditional business model of Cuban universities (until 1993). Source: Authors.

Associations with	Activities	Added Value	Relationships	Clients
- State	- Teaching	- Qualified human capital	- Student	- State (as an employer)
- Higher Education Ministry	- Research	- Diverse teaching programs oriented to cover the labor market needs	- Tutors	- Employers
- Embassies	- Extension	- Cutting edge knowledge by diversifying research fields	- Secretariat	- Enterprises
- Universities	Resources and capabilities		Channels	- Universities
	- Students		- Working placement	- Society
	- Professors		- Editorials and scientific agencies	- Cuban students
	- Researchers		- Events and socio-cultural projects	- Foreign students
	- External agents			- Research community (foundations, centers)
	- Infrastructures			
	- Budget			
Costs		Income		
-		Non-monetary		
- Salaries		-		
- Costs for infrastructure for teaching and research		- University recognition/prestige		
- Costs for infrastructure and administration		- Scientific publications, patents, copyrights		
- Other costs		Monetary		
		-		
		- Government budget		
		- Scholarship funds		
		- Enrolment		

In the Cuban university system, the new mission was conceived as the university extension towards the development of social actions. It implies entrepreneurial and innovative orientations to support the transformation of productive actors towards sustainable development. In this vein, the Cuban university became the provider of technological solutions to the productive sectors' needs

(i.e., scientific events, professional services, technological applications, and property rights for using patents and tests). According to the representatives of productive sectors, “the 1990s scenario made it possible to exploit the university’s capabilities and to expand the university’s activities towards new professional services like consultancy” (Interview P2). The premise was the production, transfer and appropriation of innovations that democratically satisfy the social aspirations of the population and promote the economic development (Table 6).

Table 6. The new elements of the business model of Cuban universities (since 1993). Source: Authors.

Associations with +		Activities +		Added Value +		Relationships +		Clients +	
-	Productive sector	-	Product development	-	Post-graduate programs	-	R&D collaboration and networks	-	Government
-	Ministries	-	Technology transfer	-	Technological and innovative advances	-	Research agreements, contracts	-	Universities' (Cuban and foreign)
-	Research institutions and centers	-		-	Specialized services				Enterprises, family organizations
-	Foreign universities and associations		Post-graduate programs					-	Ministries
		Resources +				Channels +		Research institutions and centers	
		-	University community (staff, academics, professors)			-	Innovative methodologies within courses		
		-	R&D specialists and capabilities			-	Post-graduate programs		
		-	Entrepreneurial leadership						
<hr/>									
Costs +					Income +				
-	Knowledge transfer management				-	Enrolment and tuition from foreign students			
-	R&D personnel				-	Scientific and technological events (fees)			
-	R&D infrastructure				-	Specialized services (fees)			
-	Post-graduate programs				-	R&D collaborations			

mechanism to maximize its social value. The second element was the integration and complete cycle of teaching, investigation, knowledge production, and technological commercialization. Based on the university's strategic vision and collaborative networks with productive sectors, both agents faced an adaptation process looking for sustainable outcomes with practical applications and social impacts. The third element was a hybrid infrastructure created to manage knowledge. It also allowed the inclusion of students in university-industry projects oriented towards knowledge generation and transfer processes. According to the productive sector, "the biggest novelty was the new university learning production model, which included the participation of undergraduate students in the development of technological projects. It has been an excellent certification of students' capabilities" (Interview I6). This role has been crucial in the training of technology assimilating workers. Therefore, ensuring the human capital required in the research, development, and innovation process as part of the professional development cycle.

4.3. The Challenges of a Social, Innovative, and Entrepreneurial Identity

Cuban universities have adopted the traditional business model focused on achieving the teaching activities (i.e., educational programs and vocational education programs). Therefore, by adopting the business model innovation literature, the transformation of the Cuban university model still faces three crucial challenges according to the interviews. The first challenge is the ability to explore and exploit opportunities to diversify income. It is aligned with findings of previous studies that explain that the diversification of income implies the understanding of potential value for the stakeholders, as well as their potential involvement in the co-creation and definition of this value [21]. Moreover, the entrepreneurial and innovative role of the university also demands legitimization within a society characterized by a national culture oriented toward a social perspective. Therefore, it also requires the support of the State via regulations, as well as social norms [11]. The second challenge is the balance between an entrepreneurial and social identity. According to the university actors, "the idea is to approach a complementary self-financing system where every participant obtains benefits from their contributions based on the social essence of the Cuban university" (Interview UA1). The entrepreneurial identity implies new capabilities in the university community [31]. In this line, the challenge has been recognizing as an agent of change that reorganizes organizational structures by aligning the social mission (training qualified professionals), the innovative mission (making contributions in science, technology, and innovation for the development of the country), and the entrepreneurial mission (diversify income streams and technological commercialization). As a result, the university will serve society by improving the quality of life through technological innovations and human capital [19]. The third challenge is the exploitation of competitive advantages by creating a network and alliances with crucial partners or agents [42,43]. It implies the engagement of capabilities for stimulating informal and formal relationships with networks, alliances, or collaboration partners.

5. Conclusions

This paper proposed a conceptual model to analyze the transition process of the university located in socialist economies into a social, innovative, and entrepreneurial organization. By adopting the prospective case study approach, we analyzed the identity transition of Cuban universities by exploring the business model. As the business model innovation is a tool that allows identifying the strategic university actions for generating and capturing value, this analysis also allowed identifying how Cuban universities aligned the social, innovative, and entrepreneurial identities.

Our findings showed insights about the determinants in the transition into a social, entrepreneurial and innovative identity (state regulation; the integration and complete cycle of teaching, investigation, knowledge production and technological commercialization; and hybrid infrastructures created to manage knowledge), as well as the challenges faced by Cuban universities (the ability to explore and exploit opportunities to diversify income; the balance between an entrepreneurial and social identity; the exploitation of competitive advantages by creating networks and alliances with crucial partners or

agents). Our study contributes to the entrepreneurship literature by proposing a conceptual framework to understand the transition of universities located in socialist economies into social, entrepreneurial, and innovative organizations [8,10,31], as well as to the innovation literature by using business model innovation for operationalizing the aligning of universities' identities [21,45,47–49].

This research has several limitations. The first limitation has been the lack of evidence about the impacts of each identity of Cuban universities in terms of wellbeing, technological transformation, and economic development. Future research should explore the impacts generated by each university identity: social, innovative, and entrepreneurial. It demands longitudinal and in-depth studies [35]. The second limitation is the lack of evidence about the link with stakeholders. Our interviews provide insights about the contribution of Cuban universities to the productive sector. However, the stakeholder's perspective should be included in the future research agenda [10,34]. The third limitation is the lack of evidence about the effectiveness of the Cuban State policies. Although the strategy was designed to improve the country's competitiveness, there is no evidence about the achievement of the expected outcomes [18,47,48]. The fourth limitation is associated with the metrics used in our semi-structured interviews. Future research should consider the implementation of quantitative metrics that allow understanding of interviewees' perceptions as well as explore causal relationships.

Several implications emerge from this study. An important implication is that Cuban universities must adopt an entrepreneurial and social perspective. From this point of view, the implementation of a social entrepreneurial business model may be an alternative to ensure the immersion of the university community into the transformation process. The entrepreneurial and social identity may ensure the sustainability of the university as well as its contribution to society. The new university's identity demands an entrepreneurial mindset and culture within the university community (students, academics, university managers) and among its stakeholders. At the country level, it implies the participation of multiple actors (government, university, productive sector, and society) in the sensibilization process for a better understanding of the entrepreneurship phenomenon in the university context. At the university level, it also implies the evolution of the university's routines towards capabilities for sensing opportunities to generate added value to the society (productive sectors' needs and demands), seizing the resources to address the opportunities (channels and collaborations), and transforming the resources into innovative outputs (research agendas, technology transfer, and socio-economic development) [49].

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Data analysis.

ID	Traditional Model																		Business Model Innovation																												
	Associations				Core Activities			Resources and Capabilities			Added Value			Clients			Income			Associations			Core Activities			Resources and Capabilities			Added Value			Clients			Income				Associations								
	A1	A2	A3	A4	B1	B2	B3	C1	C2	C3	D1	D2	D3	E1	E2	E3	E4	F1	F2	F3	F4	A5	A6	A7	A8	B4	B5	B6	C1	C4	C5	D4	D5	D6	E1	E2	E3	E4	F5	F6	F7	F8					
ua1	x	x		x	x	x	x	x	x	x	x		x	x	x		x	x		x	x		x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x						
ua2	x				x	x	x	x	x	x		x		x	x	x	x	x		x		x	x	x			x	x	x		x	x			x		x	x	x	x	x	x	x				
ua3	x	x	x		x	x	x	x	x	x	x	x		x			x	x	x	x	x	x		x	x	x	x	x	x	x		x	x			x		x	x	x	x	x	x	x			
ua4	x	x			x	x	x	x	x	x		x	x	x		x			x	x	x	x		x	x	x	x	x	x	x		x	x			x	x	x	x	x	x	x	x	x			
ua5	x				x	x	x	x	x	x		x		x			x	x	x	x	x	x	x			x	x	x	x	x		x	x	x	x	x	x			x	x	x	x	x			
ua6	x	x			x	x	x	x	x	x	x	x		x	x	x		x	x	x	x	x	x			x	x	x	x	x		x	x	x	x	x			x	x	x	x	x	x	x		
ua7	x		x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x		x	x	x	x	x	x	x	x		x		x	x			x	x			x	x	x			
ua8	x	x			x	x	x	x	x	x		x		x	x		x			x	x	x	x				x	x	x			x	x	x				x		x	x				x		
ua9	x		x	x	x	x	x	x	x	x	x	x		x		x	x		x	x	x	x	x	x	x			x	x	x	x	x		x	x			x			x	x	x	x			
ua10	x		x	x	x	x	x	x	x	x			x	x	x	x		x			x	x	x	x	x	x		x	x			x					x				x	x			x		
ua11	x				x	x	x	x	x	x	x		x		x	x		x	x	x		x			x	x	x	x	x			x					x				x	x			x		
i1	x	x			x	x	x	x	x	x	x		x	x	x	x	x			x	x	x			x	x	x	x	x	x		x	x				x	x	x	x	x	x	x	x			
i2	x				x	x	x	x	x	x	x		x	x	x	x	x			x	x						x	x	x			x	x					x				x	x	x	x		
i3	x	x			x	x	x	x	x	x	x			x	x				x	x	x		x	x	x		x	x	x			x		x			x			x	x	x	x	x	x		
i4	x	x	x		x	x	x	x	x	x	x	x	x	x				x	x	x	x	x			x	x	x	x	x	x		x		x			x			x	x	x	x	x	x		
i5	x				x	x	x	x	x	x	x	x	x	x			x	x	x		x	x	x	x			x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	x			
i6	x	x			x	x	x	x	x	x	x		x	x	x	x	x	x	x		x	x			x	x	x	x	x	x		x		x				x			x	x	x	x			
p1	x	x	x		x	x	x	x	x	x	x		x	x		x			x	x	x	x	x			x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	x			
p2	x	x			x	x	x	x	x				x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	x		x	x	x			x	x	x			x	x	x			
p3	x	xx			x	x	x	x		x		x		x			x	x	x	x	x		x			x	x	x	x	x	x	x	x			x			x			x	x	x	x		

Associations: A1: State; A2: Ministries; A3: Embassies; A4: Universities; A5: Productive sector; A6: Research institutions and centers; A7: Foreign Universities; A8: Associations. **Core activities:** B1: Teaching; B2: Research; B3: Extension; B4: Product development; B5: Technology Transfer; B6: Post-graduate programs. **Resources and Capabilities:** C1: university community (students, professors, researchers); C2: infrastructures and external agents; C3: budget; C4: R&D specialists; C5: Entrepreneurial leadership. **Value-added:** D1: Qualified students; D2: Teaching oriented to the labor market; D3: Cutting edge knowledge; D4: Post-graduate programs; D5: Technological/innovations; D6: Specialized services. **Clients:** E1: State; E2: Employers, enterprises; E3: Universities, research community and research centers; E4: students and society. **Income:** F1: University recognition; F2: Scientific production; F3: Government budget; F4: Scholarship funds and enrolment; F5: Tuition from international students; F6: Fees of scientific events; F7: Specialized services; F8: R&D collaboration.

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